

REMARKS

The Examiner is thanked for the performance of a thorough search.

No claims have been added, deleted, or amended. Hence, Claims 23-29 and 37-39 are pending in this application. All issues raised in the Office Action mailed April 19, 2007 are addressed hereinafter.

THE PENDING CLAIMS SATISFY 35 U.S.C. § 112

Claims 23 and 37 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite because these claims recite the limitation “determine whether”.

Applicants respectfully traverse.

Claims 23 and 37 both recite executing the instruction of “during said frequent itemset operation, using said selected occurrence counting technique to count occurrences of at least one combination **to determine whether said at least one combination satisfies frequency criteria** associated with said frequent itemset operation”. (emphasis added) Applicants submit that the emphasized portion cited above is definite because there are only two distinct possibilities: either (1) at least one combination satisfies the frequency criteria or (2) no combination satisfies the frequency criteria. Therefore, “determining whether at least one combination satisfies frequency criteria” will always result either in TRUE or FALSE, with no room for conjecture or indefiniteness. Consequently, Claims 23 and 37 fully meet the requirements of 35 U.S.C. § 112, and removal of this rejection is respectfully requested.

THE PENDING CLAIMS SATISFY 35 U.S.C. § 101

Claims 23-29 and 37-39 were rejected under 35 U.S.C. § 101 because they allegedly encompass transmission media within their scope.

Applicants respectfully traverse.

It appears that the Examiner has interpreted Claims 23-29 and 37-39 as claims to a “computer-readable medium”, as evidenced by the Examiner’s citation of paragraphs 143-145 of the Specification, which describe the term “computer-readable medium”. Claims 23-29 and 37-39, however, are not directed to a computer-readable medium; they are directed to a method. Because they are method claims, Claims 23-29 and 37-39 do not and cannot claim any transmission media within their scope. Rather, Claims 23-29 and 37-39 claim the steps of a process. Furthermore, a process is expressly recognized as being patentable subject matter under 35 U.S.C. § 101. Therefore, Claims 23-29 and 37-39 satisfy the requirements of 35 U.S.C. §§ 101. Removal of the rejection is respectfully requested.

THE PENDING CLAIMS ARE PATENTABLE OVER THE CITED ART

Claims 23-29 and 37-39 were rejected under 35 U.S.C. § 102 and 35 U.S.C. § 103 over the cited art.

Applicants note that the rejections in the current Office Action are virtually identical to those in the Office Action dated April 4, 2006, to which the Applicants responded on July 5, 2006. Furthermore, Applicants note that there is no section in the current Office Action which responds to the Applicants’ previously made remarks. Based on these two facts, coupled with the fact that the Examiner for this application has been changed since the Office Action dated April 4, 2006, Applicants believe that the current Office Action was prepared without knowledge of the Applicants’ previous response. That response fully addressed all of the issues raised in the current Office Action with regard to the cited art. For the Examiner’s convenience, the arguments from that previous response are reproduced hereinafter.

For the reasons explained hereinafter, each of the pending claims recites at least one element that is not disclosed, taught, or suggested by U.S. Patent No. 6,324,533 issued to

Agrawal et al. (“Agrawal”) or *High Performance Mining of Maximal Frequent Itemsets*, by Gosta Grahne and Jianfei Zhu (“Grahne”).

CLAIMS 23-29

Claim 23 recites:

“dynamically selecting which occurrence counting technique to use from a plurality of available occurrence counting techniques by performing the steps of:
generating cost estimates for each of the plurality of available occurrence counting techniques based on an estimated I/O cost of using the available occurrence counting technique, and
selecting the occurrence counting technique that has the lowest estimated cost; and
during said frequent itemset operation, using said selected occurrence counting technique to count occurrences of at least one combination to determine whether said at least one combination satisfies frequency criteria associated with said frequent itemset operation.” (emphasis added)

At least the above-bolded portions of Claim 23 are not disclosed, taught, or suggested by *Agrawal* or *Grahne*, either individually or in combination.

Claim 23 is directed towards an approach for performing a frequent itemset operation. According to the approach of Claim 23, a selected occurrence counting technique is dynamically selected from a plurality of available occurrence counting techniques. To select an occurrence counting technique, cost estimates for each of the plurality of available occurrence counting techniques are generated. The cost estimates are based on an estimated I/O cost of using the available occurrence counting technique. For example, the occurrence counting technique that has the lowest estimated cost may be selected. During the frequent itemset operation, the selected occurrence counting technique is used to count occurrences of at least one combination to determine whether the combination satisfies frequency criteria associated with the frequent itemset operation

On the other hand, while *Agrawal* describes an approach for performing a frequent itemset operation, *Agrawal* lacks any teaching or suggestion of anything analogous to generating cost estimates for each of a plurality of available occurrence counting techniques based on an estimated I/O cost of using the available occurrence counting technique. As a result, several elements of Claim 23 are not shown by *Agrawal*.

To illustrate, Claim 23 recites the element of “generating cost estimates for each of the plurality of available occurrence counting techniques based on an estimated I/O cost of using the available occurrence counting technique.” *Agrawal* does discuss criteria for choosing the best SQL-OR approach (see Col. 11, line 37- Col. 12, line 30); however, there are significant differences between the teaching of *Agrawal* and the requirements of this element. For example, *Agrawal* does not choose the best SQL-OR approach based on an estimated I/O cost of using an available occurrence counting technique. Instead, the cost analysis performed by *Agrawal* involves examining “data characteristics like the number of items, total number of transactions, and average length of a transaction” (See Col. 11, lines 38-40). Examining characteristics of the data is not analogous to estimating the I/O cost of using an available occurrence counting technique because on different machines the same data characteristics may have different I/O costs. As a result, the concepts are orthogonal. Therefore, *Agrawal* cannot disclose, teach, or suggest this element.

Similarly, *Grahne* also lacks any teaching or suggestion of this element. Thus, the combination of *Agrawal* and *Grahne* would still fail to teach or suggest this element.

As at least one element is not disclosed, taught, or suggested by *Grahne* or *Agrawal*, either individually or in combination, it is respectfully submitted that Claim 23 is patentable over the cited art and is in condition for allowance.

Claims 24-29 all depend from Claim 23, and therefore, include all of the limitations of Claim 23. It is therefore respectfully submitted that Claims 24-29 are patentable over the cited art for at least the reasons set forth herein with respect to Claim 23. Furthermore, it is respectfully submitted that Claims 24-29 recite additional limitations that independently render them patentable over the cited art.

For example, Claims 25 recites the element of “generating an I/O cost estimate for a prefix tree technique based, at least in part, on a size of the candidate prefix tree and an amount of memory that can be used to store the candidate prefix tree.” No cited art reference suggests the performance of this step.

As another example, Claim 27 recites “generating an I/O cost estimate for a bitmap intersection technique based, at least in part, on a cost of reading bitmaps for each frequent item.” No cited art reference suggests the performance of this step.

As a further example, Claim 29 recites “determining that a particular occurrence counting technique will not be considered during any phase of the frequent itemset operation; and performing the frequent itemset operation without performing startup operations for said particular occurrence counting technique.” No cited art reference suggests the performance of this step. For example, the portion of *Agrawal* previously cited to show this subject matter (Col. 11, lines 40-44) lacks any suggestion of (a) a particular occurrence counting technique that will not be considered during any phase of a frequent itemset operation or (b) performing a frequent itemset operation without performing startup operations for a particular occurrence counting technique.

CLAIMS 37-39

Claim 37 recites:

“dynamically selecting which occurrence counting technique to use from a plurality of available occurrence counting techniques based on conditions existing in a computing environment in which the frequent itemset operation is to be performed, wherein the conditions include one or more of (a) workload of a computer system executing the frequent itemset operation, and (b) resources available on said computer system; and
during said frequent itemset operation, using said selected occurrence counting technique to count occurrences of at least one combination to determine whether said at least one combination satisfies frequency criteria associated with said frequent itemset operation.” (emphasis added)

At least the above-bolded portions of Claim 37 are not disclosed, taught, or suggested by *Agrawal* or *Grahne*, either individually or in combination.

Claim 37 recites the element of “dynamically selecting which occurrence counting technique to use from a plurality of available occurrence counting techniques based on conditions existing in a computing environment in which the frequent itemset operation is to be performed, wherein the conditions include one or more of (a) workload of a computer system executing the frequent itemset operation, and (b) resources available on said computer system.”

The portion of *Agrawal* (Col. 11, lines 17-33 and Col. 12, lines 21-32) cited to show this element (which was previously recited in Claim 10) does discuss criteria for choosing the best SQL-OR approach. These criteria involve examining “data characteristics like the number of items, total number of transactions, and average length of a transaction” (See Col. 11, lines 38-40). Indeed, the entire teaching of *Agrawal* is centered upon examining the characteristics of the data in choosing the best SQL-OR approach, and does not consider any factor. In sharp contrast, Claim 37 requires that the occurrence counting technique is selected “based on conditions existing in a computing environment in which the frequent itemset operation is to be performed.” *Agrawal* lacks any teaching or suggestion of considering conditions existing in a computing

environment in which the frequent itemset operation is to be performed. Moreover, Claim 37 specifies what those conditions include, namely that the conditions include one or more of (a) workload of a computer system executing the frequent itemset operation, and (b) resources available on said computer system. These requirements are also not disclosed, taught, or suggested by *Agrawal*. Consequently, the above-bolded elements cannot be shown by *Agrawal*.

As at least one element is not disclosed, taught, or suggested by *Grahne* or *Agrawal*, either individually or in combination, it is respectfully submitted that Claim 37 is patentable over the cited art and is in condition for allowance.

Claims 38-39 all depend from Claim 37, and therefore, include all of the limitations of Claim 37. It is therefore respectfully submitted that Claims 38-39 are patentable over the cited art for at least the reasons set forth herein with respect to Claim 37. Furthermore, it is respectfully submitted that Claims 38-39 recite additional limitations that independently render them patentable over the cited art. However, in view of the fundamental differences already identified between Claims 38-39 and the cited art, separate arguments explaining the differences between those additional limitations recited in Claims 38-39 and the cited art will not be presented herein.

CONCLUSION

It is respectfully submitted that all of the pending claims are in condition for allowance and the issuance of a notice of allowance is respectfully requested. If there are any additional charges, please charge them to Deposit Account No. 50-1302.

The Examiner is invited to contact the undersigned by telephone if the Examiner believes that such contact would be helpful in furthering the prosecution of this application.

Respectfully submitted,

HICKMAN PALERMO TRUONG & BECKER LLP

Respectfully submitted,

HICKMAN PALERMO TRUONG & BECKER LLP

Yp Liao

Date: July 19, 2007

Yiping R. Liao
Reg. No. 60,301

2055 Gateway Place, Suite 550
San Jose, CA 95110-1089
Telephone: (408) 414-1080
Facsimile: (408) 414-1076

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Amendment, Hon. Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

on July 19, 2007 by *Martina Placid*
Martina Placid